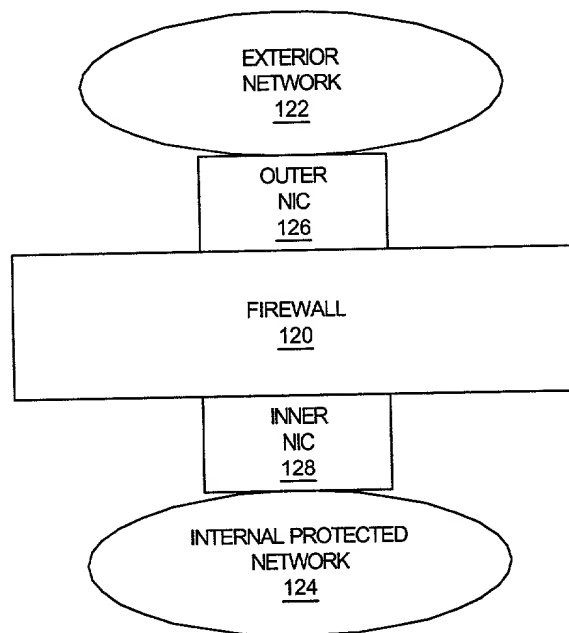


Prior Art

Figure 1A



Prior Art

Figure 1B

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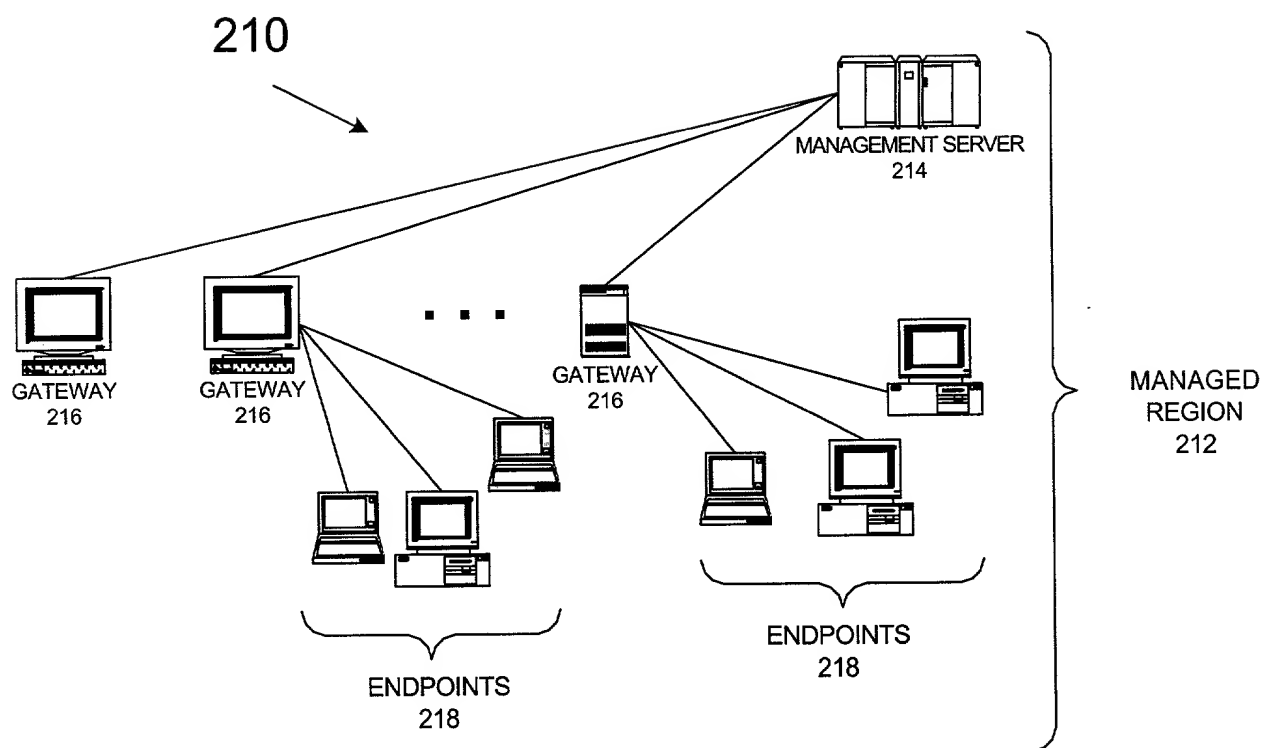


Figure 2A

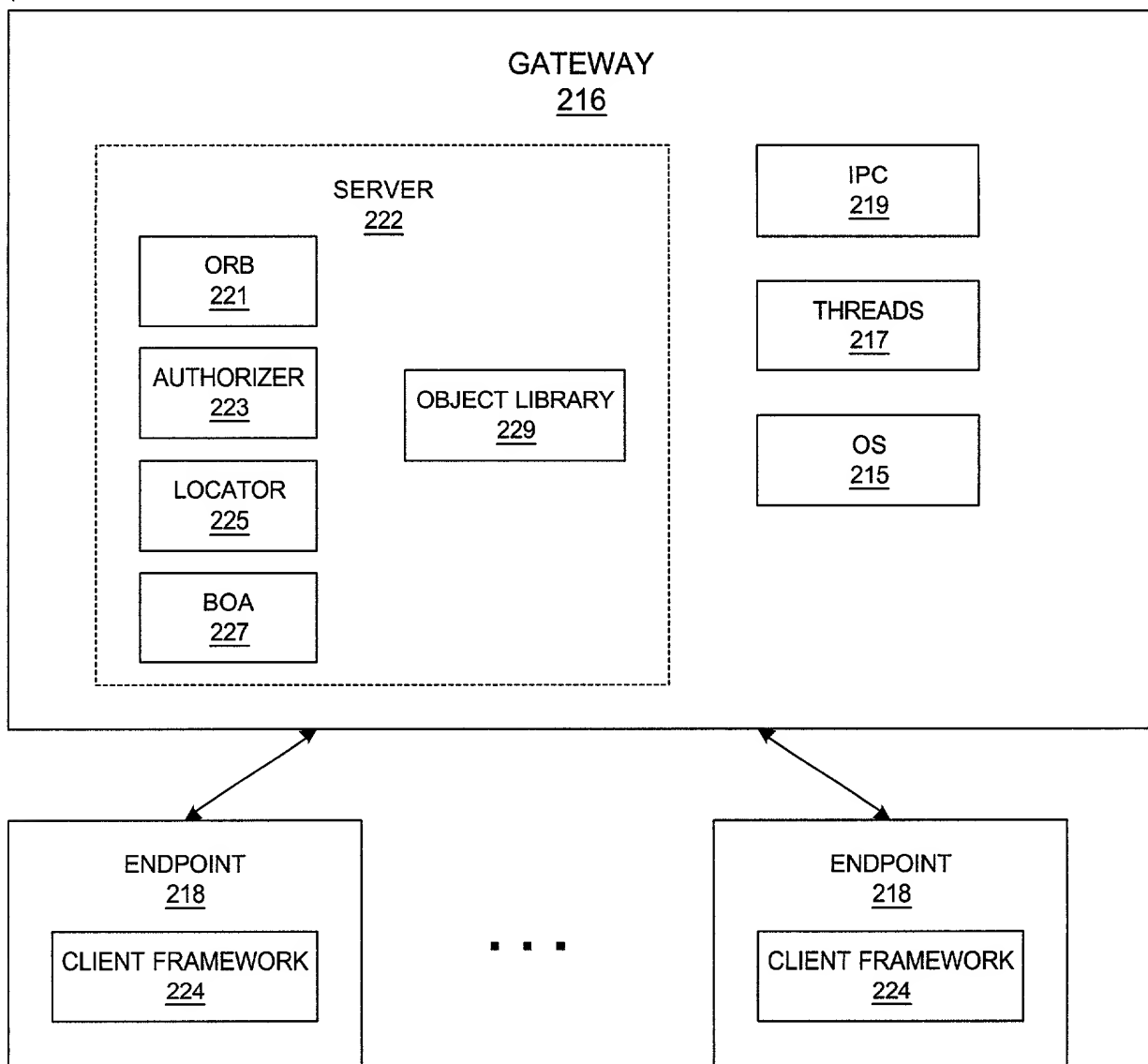


Figure 2B

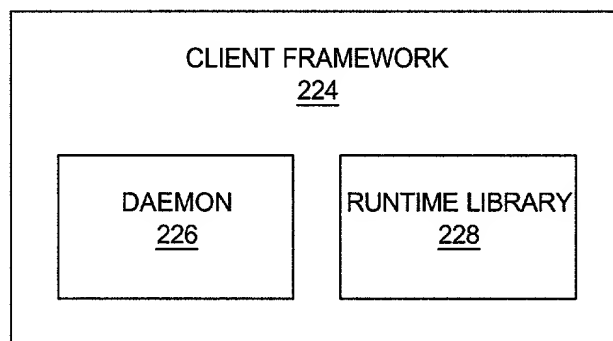


Figure 2C

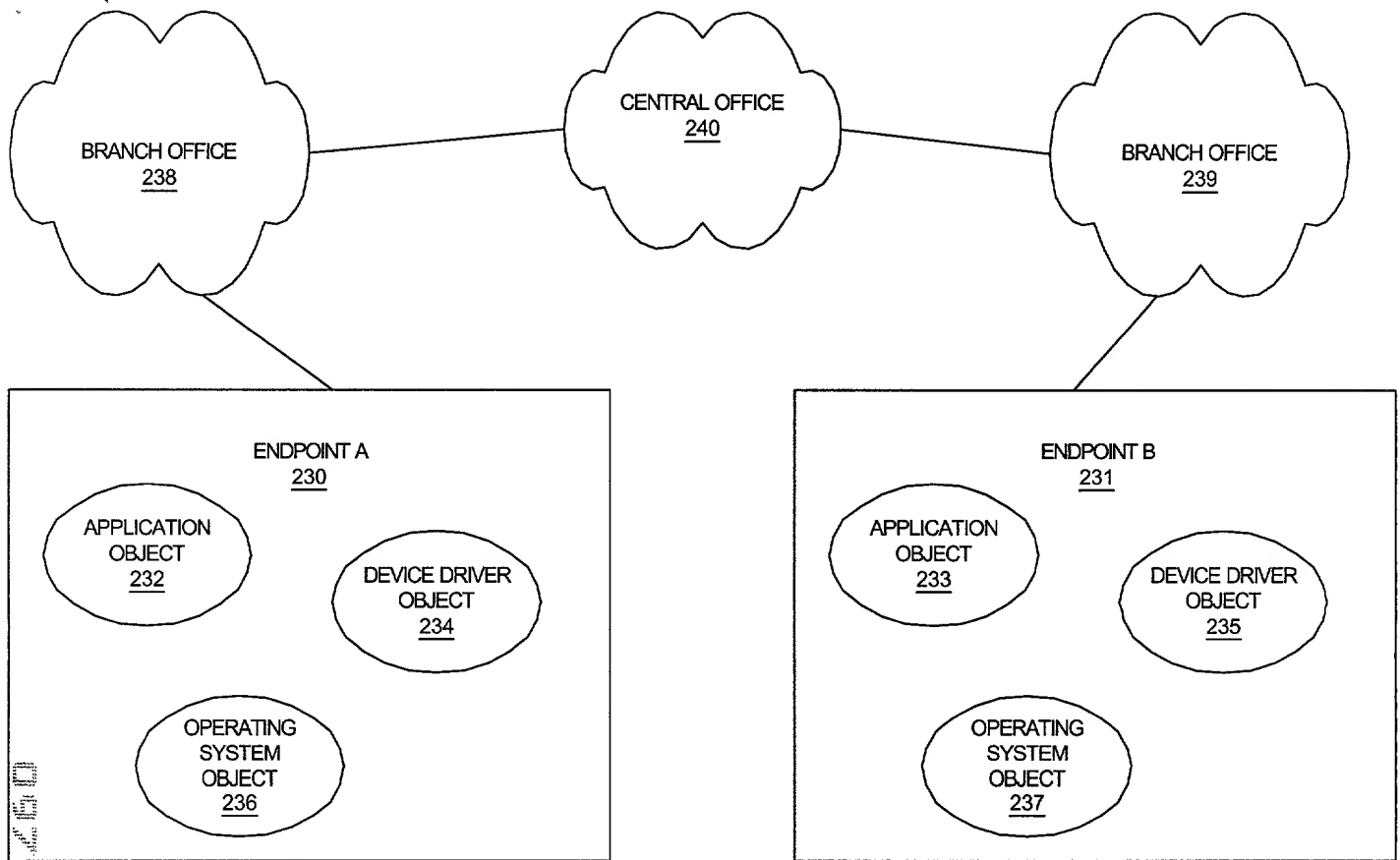


Figure 2D

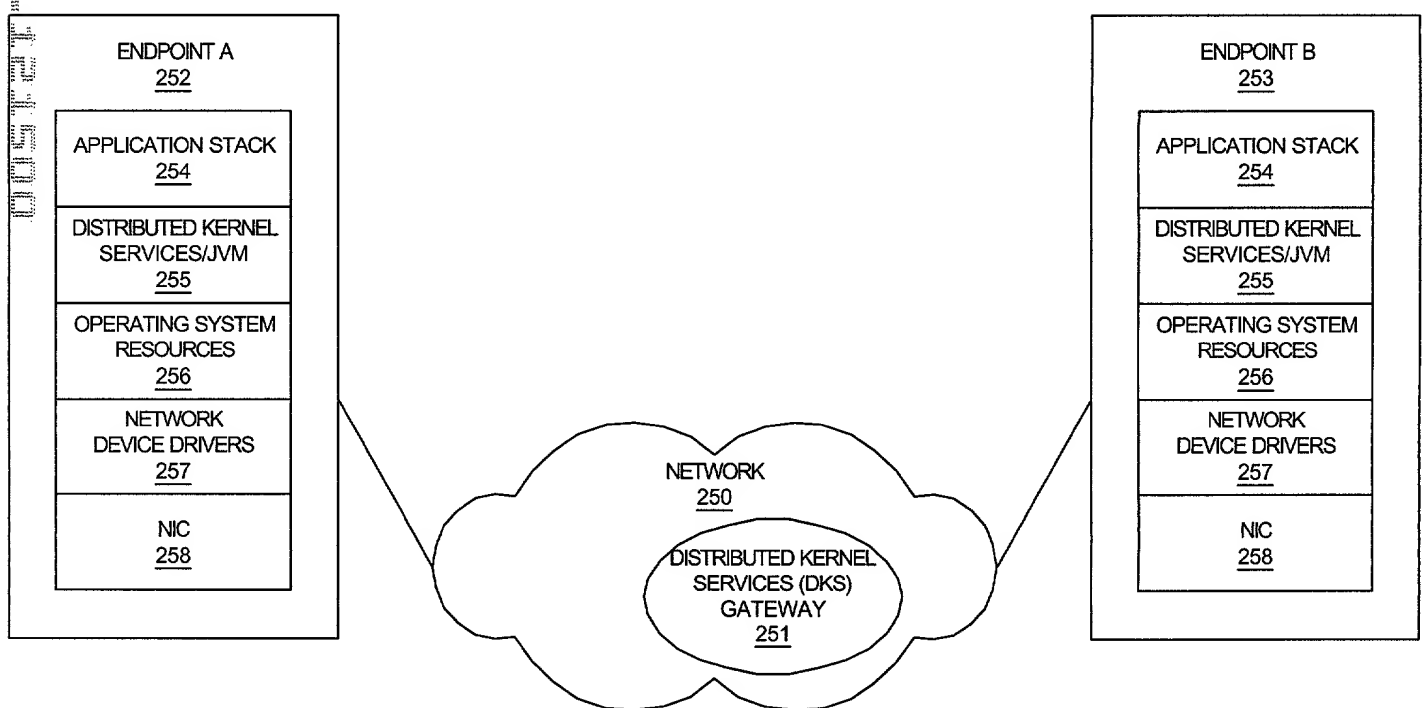


Figure 2E

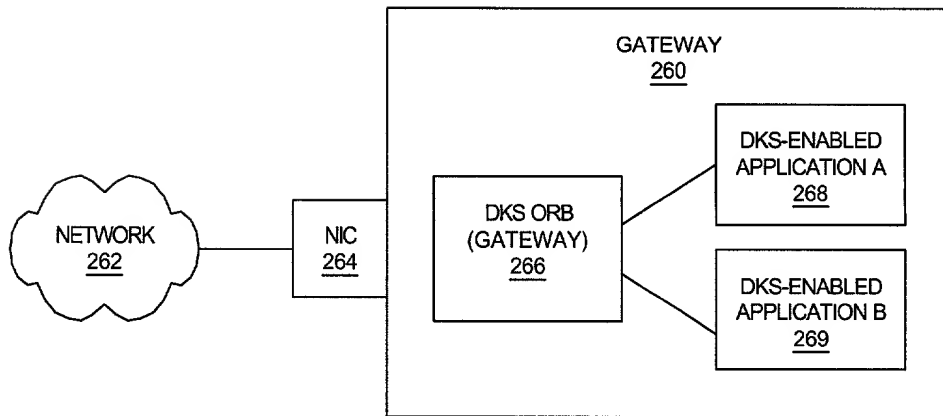


Figure 2F

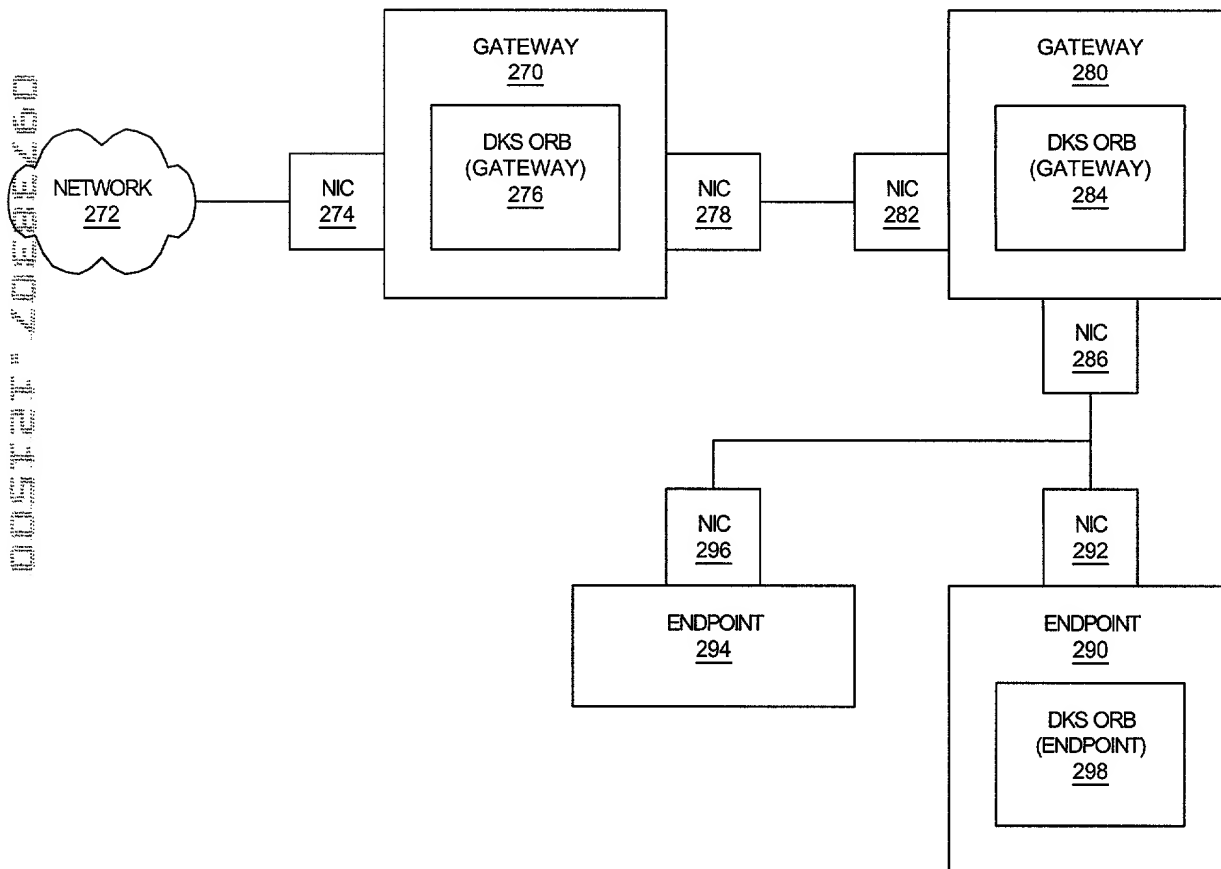


Figure 2G

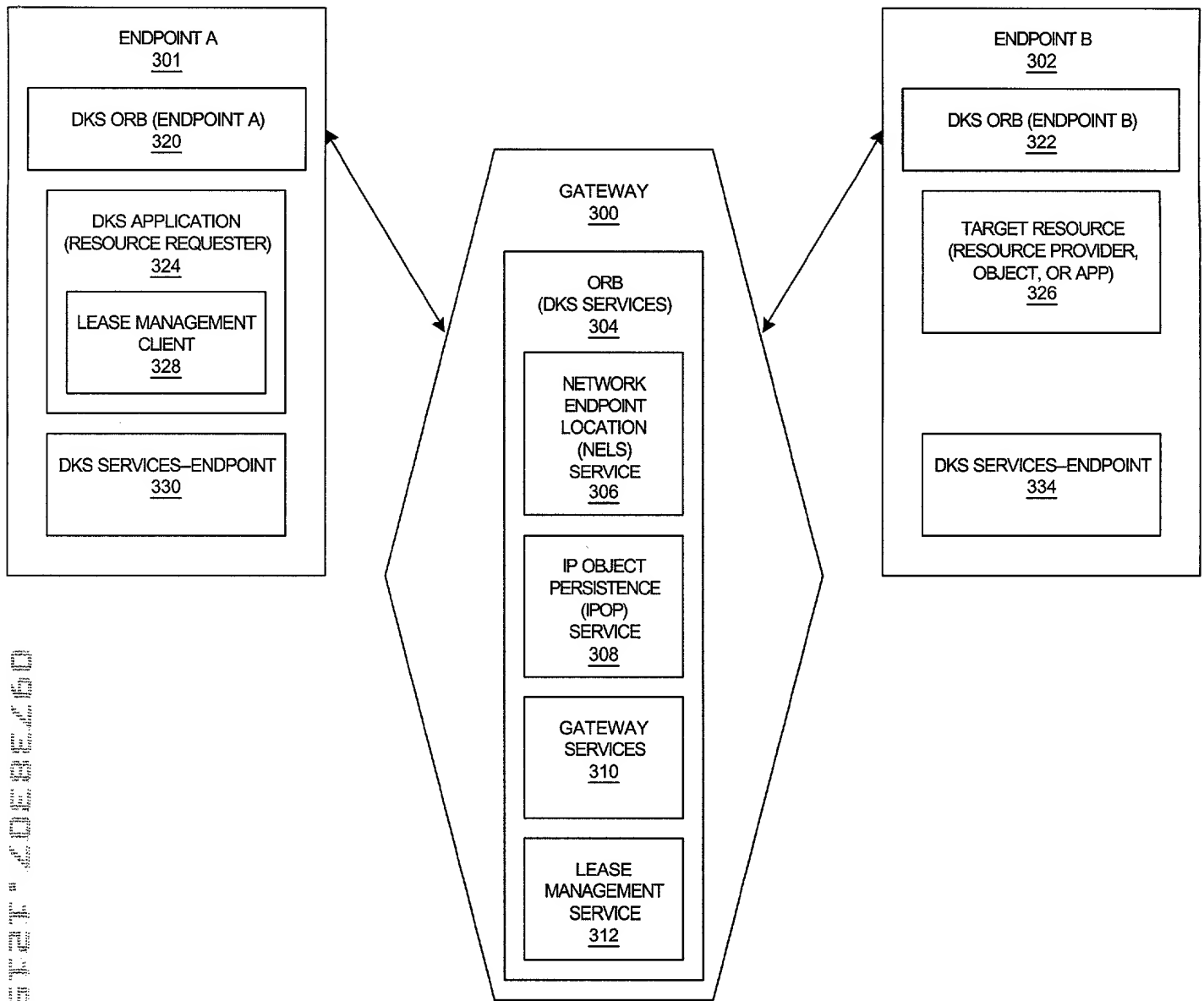


Figure 3

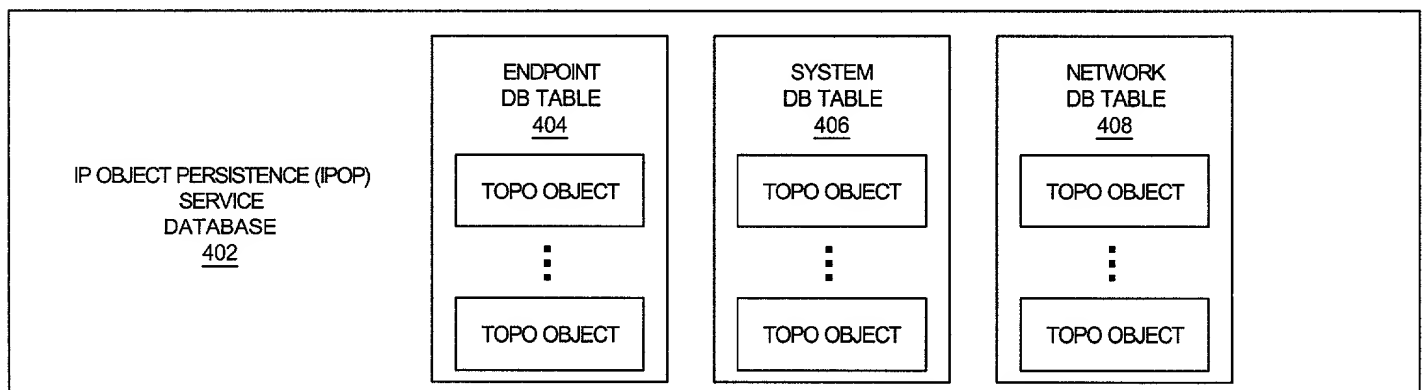


Figure 4

500



```
graph TD; A([BEGIN]) --> B[CHECK APP FROM RESOURCES  
602]; B --> C[IDENTIFY AND CONFIGURE  
FEASIBLE RESOURCES  
604]; C --> D[RE JVM FOR LEASING CERTAIN  
RESOURCES  
606]; D --> E[RE APPLICATIONS AND USERS  
FOR LEASING RESOURCES  
608]; E --> F[IALIZE FOR PROCESSING  
ACTION OBJECTS  
610]; F --> G([END]);
```

The flowchart illustrates a process for leasing resources. It begins with a 'BEGIN' terminal, followed by a sequence of steps: 'CHECK APP FROM RESOURCES 602', 'IDENTIFY AND CONFIGURE FEASIBLE RESOURCES 604', 'RE JVM FOR LEASING CERTAIN RESOURCES 606', 'RE APPLICATIONS AND USERS FOR LEASING RESOURCES 608', and 'IALIZE FOR PROCESSING ACTION OBJECTS 610'. The process concludes with an 'END' terminal.

```
graph TD; A([BEGIN]) --> B[DISCOVER PHYSICAL NETWORK TOPOLOGY  
652]; B --> C[ASSIGN OBJECT ID'S TO EACH ENDPOINT  
IN IPOP DB  
654]; C --> D[CREATE ACTION OBJECT ROUTES IN IPOP USING  
GATEWAY CONFIGURATION SERVICES  
656]; D --> E[STORE VALID LEASE TIMES FOR ALL ENDPOINTS  
BY USER AND/OR TARGET RESOURCE  
658]; E --> F([END])
```

The flowchart 650 illustrates the process of creating action object routes in IPOP using gateway configuration services. The process begins with a 'BEGIN' terminal, followed by a rectangular process block labeled 'DISCOVER PHYSICAL NETWORK TOPOLOGY' with reference numeral 652. This is followed by another rectangular process block labeled 'ASSIGN OBJECT ID'S TO EACH ENDPOINT IN IPOP DB' with reference numeral 654. The next step is a rectangular process block labeled 'CREATE ACTION OBJECT ROUTES IN IPOP USING GATEWAY CONFIGURATION SERVICES' with reference numeral 656. This is followed by a final rectangular process block labeled 'STORE VALID LEASE TIMES FOR ALL ENDPOINTS BY USER AND/OR TARGET RESOURCE' with reference numeral 658. The process concludes with an 'END' terminal.

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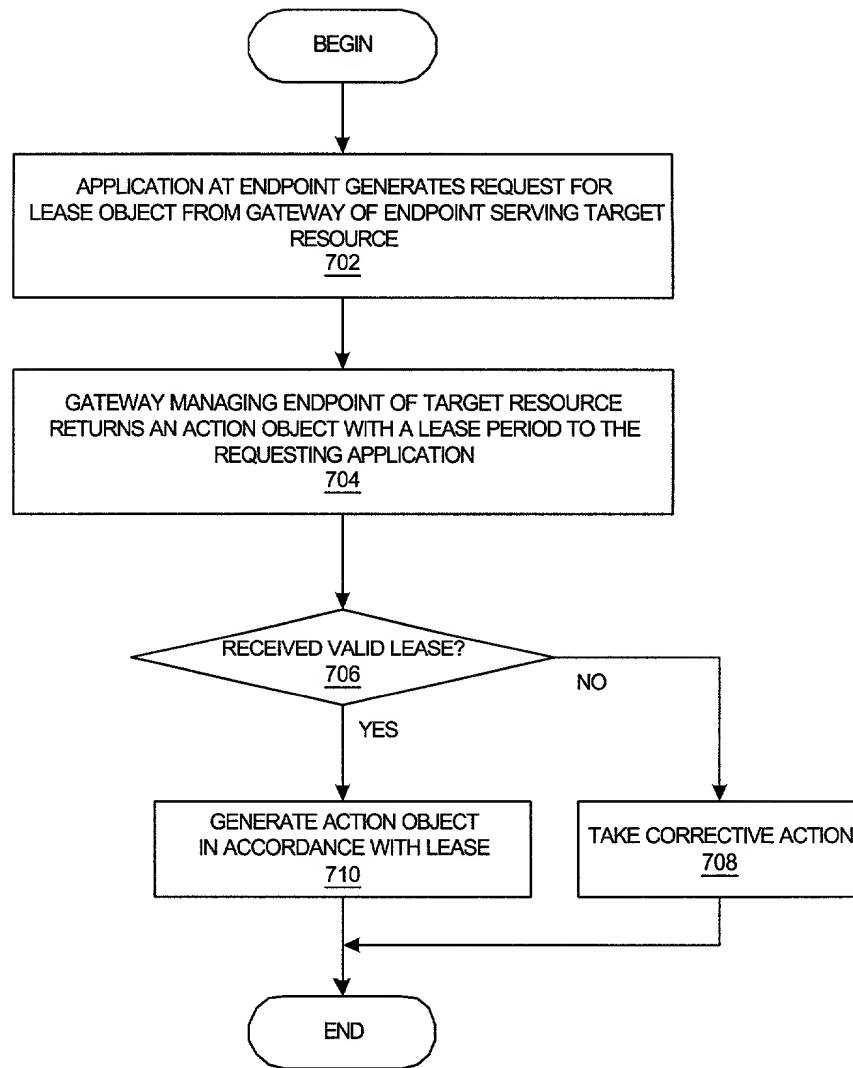


Figure 7A

```

CLASS ACTION_OBJECT {
    // CONSTRUCTOR
    ACTION_OBJECT( LONG IPADDRESS, SHORT VIRTUALPRIVATENETWORKADDRESS )
        THROWS BADADDRESS ...
    .
    .
    .
    VOID PERFORMACTION( ) // EXECUTES ACTION METHOD
    .
    .
    .
}
  
```

Figure 7B

```

CLASS LEASE_ACTION_OBJECT EXTENDS ACTION_OBJECT {

    // CONSTRUCTOR
    LEASE_ACTION_OBJECT( LONG IPADDRESS, SHORT VIRTUALPRIVATENETWORKADDRESS,
                        INT LEASETIME)
        THROWS      BADADDRESS, LEASETIMENOTACCEPTABLE_EXCEPTION,
                    LEASEBANDWIDTHMUSTBEREDUCED_EXCEPTION,
                    LEASETERMINATED_EXCEPTION, ...

    .
    .
    .

    PUBLIC INT LEASETIME;      // STORE LEASE TIME

    STATIC FINAL INFINITELEASETIME = -1;
    STATIC FINAL ZEROLEASETIME = 0;

    .
    .
    .
}

```

Figure 7C

```

CLASS LEASETIMENOTACCEPTABLE_EXCEPTION EXTENDS EXCEPTION {
    .
    .
    .
}

CLASS LEASEBANDWIDTHMUSTBEREDUCED_EXCEPTION EXTENDS EXCEPTION {
    .
    .
    .
}

CLASS LEASETERMINATED_EXCEPTION EXTENDS EXCEPTION {
    .
    .
    .
}

```

Figure 7D

```

XYZ_APPLICATION_METHOD {
    LEASE_ACTION_OBJECT      MYLEASEDACTIONOBJECT = NULL;
    .
    .
    .
    MYLEASEDACTIONOBJECT = NEW LEASEDACTIONOBJECT( . . . );
    MYLEASEDACTIONOBJECT.PERFORMACTION( . . . );
    .
    .
    .
}

```

Figure 7E

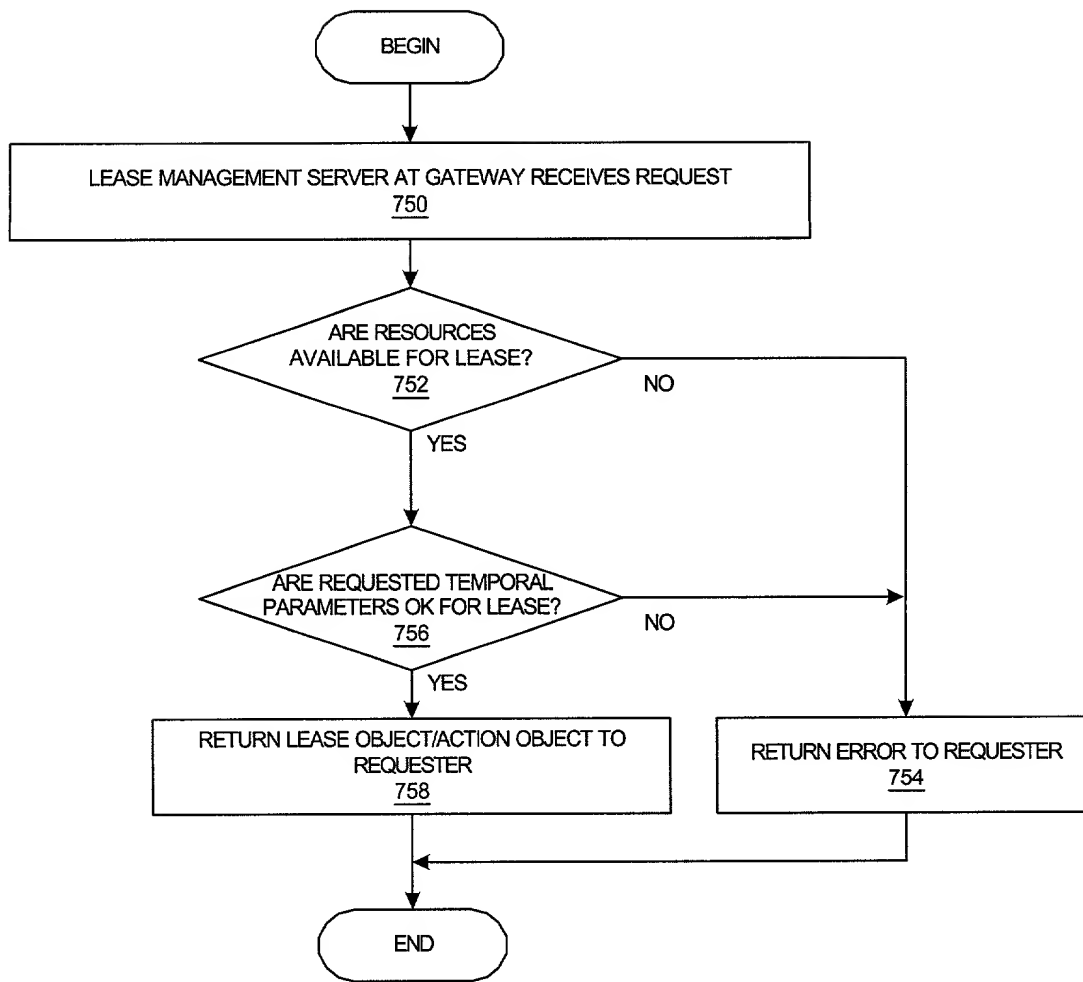


Figure 7F

```

graph TD
    BEGIN([BEGIN]) --> 772[GET ROUTE FOR LEASE  
772]
    772 --> 774[ASK OTHER GATEWAYS IF OK TO LEASE  
774]
    774 --> 776[RESERVE LEASE ON THIS GATEWAY  
776]
    776 --> 778[RECEIVE LEASE PERMISSION  
FROM OTHER GATEWAYS  
778]
    778 --> 780[START TIMER FOR LEASE  
780]
    780 --> 782[UPDATE LEASE FIELDS IN IPOP  
FOR ALL ENDPOINTS/GATEWAYS USED BY THIS LEASE  
782]
    782 --> 784[RETURN VALID LEASE  
784]
    784 --> END([END])

```

Figure 7G

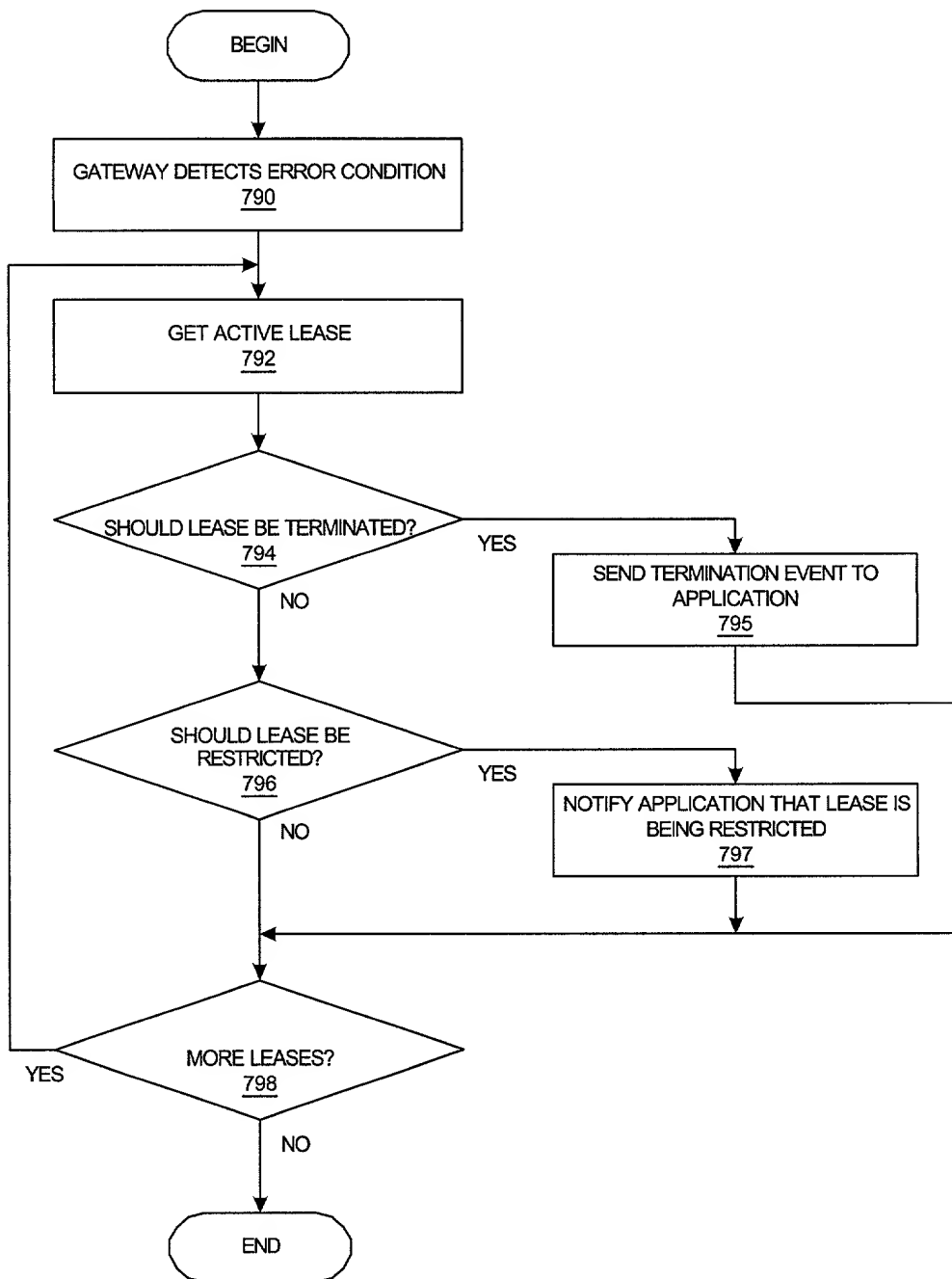


Figure 7H

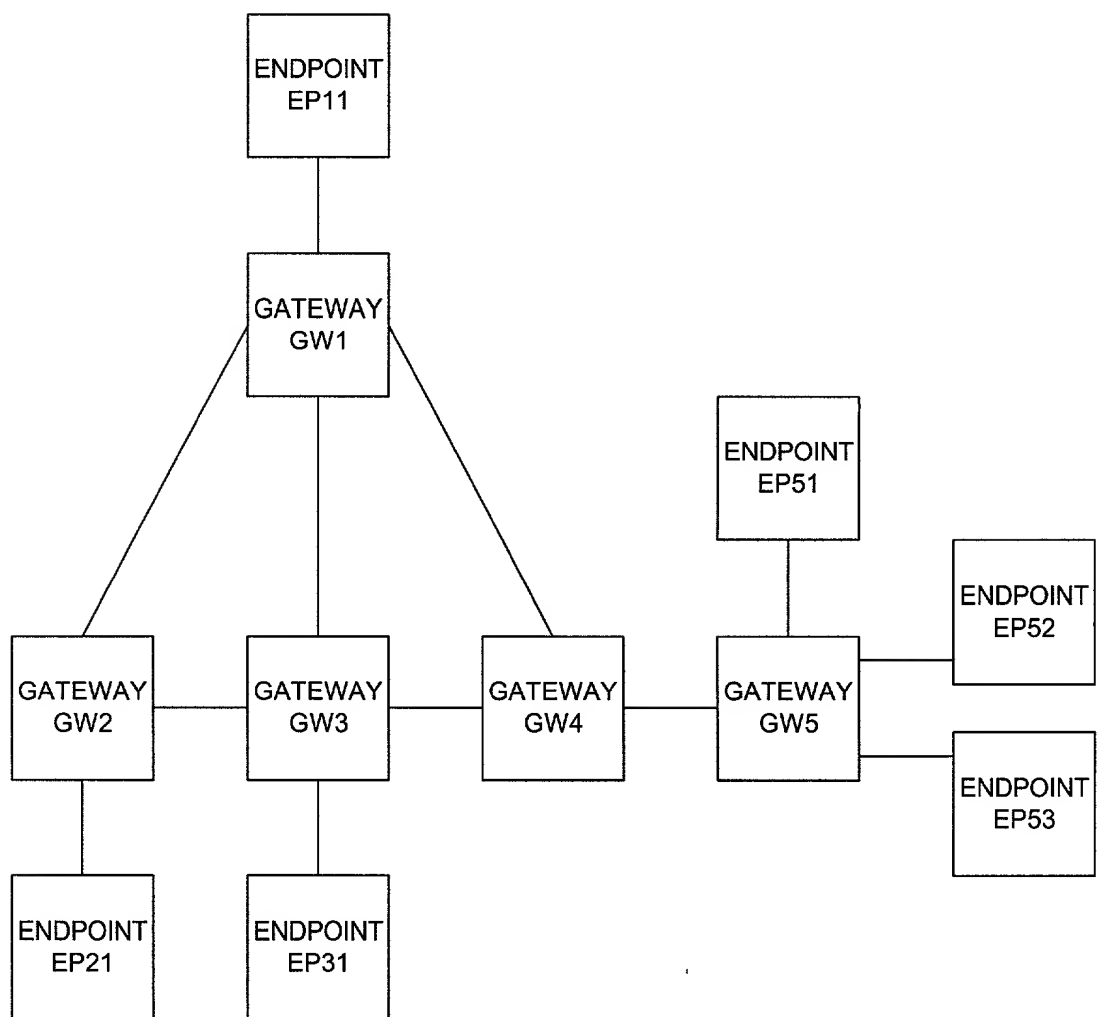


Figure 8